

APPENDIX B

Drill Hole Logs

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES

SHEET 1 of 6
HOLE NO. BIS-1
ELEV. -8.0 (Survey) FEET
DEPTH 100.0 FEET
DATE DRILLED 9/17/02 to 9/23/02
ATTITUDE Vertical
LOGGED BY T. Todd
DEPTH TO WATER 0.4'

DRILL HOLE LOG

PROJECT In-Delta Storage
FEATURE Bacon Island, Pump Station 1
LOCATION N. 37° 59.958' ; E. 121° 31.625' (GPS)
CONTR. Layne Christensen DRILL RIG CME 750
DR - 18" Standard Penetration Test
P - Shelby Tube Push
B - Bag Sample
S - Shelby Tube Sample
AD - Auger Drilling
RD - Rotary Wash Drilling

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
0.0	OL	<u>ORGANIC SOILS</u> 0.0 to 16.0'	S-1	P	0 - 2.0' Shelby Tube Push 0 psi push Recovery: 0.6'
2.0 (-10.0')			B-1		
	Pto	0.0 to 3.0' <u>Organic Soil, (OL)</u> : About 70% silt, about 30% organic peat, abundant fibers, soft to very soft; gray to black; damp to wet.		DR	2 - 3.5' SPT Drive Blows: 2/2/1 N= 3 Recovery: 0.4'
4.0				AD	Began drilling with 8" hollow-stem augers. 0-5.0' Auger drilling
6.0	Pto	3.0 to 9.0' <u>Peaty Organic Soil, (Pto)</u> : About 70% organics, abundant fibers, very soft; about 30% fines; wet; black with tints of red brown. The soil appears as slimey, ooze or muck.	S-2	P	5 - 7.0' Shelby Tube Push 0 psi push Recovered: 1.8' Sampler advanced under weight of rods.
8.0				DR	7 - 8.5' SPT Drive Blows: 0/0/0 N= 0 Recovery: 1.0' Sampler advanced under weight of rods
10.0	OH	9.0 to 16.0' <u>Organic Clay, (OH)</u> : About 90% medium to high plasticity clay, high dry strength, very soft; about 10% organic fibers; wet; olive gray.		AD	5-10.0' Auger drilling
12.0 (-20.0')			S-3	P	10 - 12' Shelby Tube Push 0 psi push Recovery: 1.6' Sampler advanced under weight of rods.
14.0	OH		B-3	DR	12 - 13.5' SPT Drive Blows: 0/0/0 N= 0 Recovery: 1.5' End of shift 9/17/02 Begin shift 9/18/02
				RD	Begin rotary wash drilling with 4 1/2" tri-blade bit and "N-rod".
16.0			S-4	P	15 - 17' Shelby Tube Push 0 psi push Recovery: 2.0'

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 2 OF 6
HOLE NO. BIS-1

PROJECT & FEATURE In-Delta Storage; Bacon Island, Pump Station 1

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
16.0		INORGANIC SOILS 16.0 to 100.0'	S-4	P	Sampler advanced under weight of rods.
	CL	16.0 to 21.0' <u>Lean Clay, (CL)</u> : About 80% low to medium plasticity clay, very soft to soft, low dry strength; about 20% nonplastic fines; trace fine sand; wet; olive gray.	B-4	DR	17 - 18.5' SPT Drive Blows: 0/1/2 N= 3 Recovery: 1.5'
18.0				RD	Rotary Drilling with 4 1/2" blade bit.
20.0	CL		S-5	P	20 - 22' Shelby Tube Push 0 - psi push Recovery: 2.0' Sampler advanced under weight of rods.
	SC	21.0 to 22.0' <u>Clayey Sand, (SC)</u> : About 80% fine, subrounded to subangular sand, very loose to loose, mostly quartz; about 20% plastic fines.	B-5	DR	22 - 23.5' SPT Drive Blows: 2/3/7 N= 10 Recovery: 1.5'
22.0 (-30.0')		22.0 to 33.0' <u>Silty Sand, (SM)</u> : About 70% mostly fine, subrounded to subangular sand, some mica, loose; about 30% nonplastic fines; wet; olive gray.		RD	Rotary Drilling Hole taking water.
24.0	SM		S-6	P	25 - 27' Shelby Tube Push 900 psi push Recovery: 1.8'
26.0		About 85% mostly fine, subrounded sand, mostly quartz; about 15% nonplastic fines; loose to slightly compact; wet; olive gray.	B-6	DR	27 - 28.5' SPT Drive Blows: 2/4/7 N= 11 Recovery: 1.5'
28.0	SM			RD	Rotary Drilling
30.0			S-7	P	30 - 32' Shelby Tube Push 700 psi push Recovery: 2.0'
32.0		Fine to medium, subrounded to subangular sand, slightly compact; wet; olive gray.	B-7	DR	32 - 33.5' SPT Drive Blows: 6/7/10 N= 17 Recovery: 1.5'
34.0 (-40.0')	SM			RD	Rotary Drilling Hole taking water.
	CL	33.0 to 42.0' <u>Lean Clay, (CL)</u> : About 60% low plasticity clay, slightly stiff; about 30% nonplastic fines; about 10% fine sand; wet; olive gray.			
36.0					

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 3 OF 6

HOLE NO. BIS-1

PROJECT & FEATURE In-Delta Storage; Bacon Island, Pump Station 1

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
36.0		<u>INORGANIC SOILS</u> 16.0 to 100.0'			
	CL	33.0 to 42.0' <u>Lean Clay, (CL):</u> (cont.) About 60% low to medium plasticity clay; about 40% nonplastic fines, low dry strength, stiff; wet; olive gray to yellow brown.		RD	Rotary drilling with 4 1/2" bit. Drilled through augers to 30', used as casing. Hole taking water. End of shift 9/18/02
38.0					
40.0			S-8	P	Begin shift 9/19/02 40 - 42' Shelby Tube Push 0 psi push Recovery: 2.0'
42.0	CL				
(-50.0')		42.0 to 45.0' <u>Silty Sand, (SM):</u> About 70% fine to coarse, subangular to subrounded sand, loose; about 30% nonplastic fines; wet; olive gray.	B-8	DR	42-43.5' SPT Drive Blows: 3/3/4 N= 7 Recovery: 1.5' (disturbed)
44.0	SM			RD	Installed 6" casing from 0 to 30'.
46.0		45.0 to 48.0' <u>Fat Clay, (CH):</u> About 100% medium to high plasticity clay, very stiff to hard, high dry strength; moist; olive green.		DR	45-46.5' SPT Drive Blows: 5/10/10 N= 20 Recovery: 1.0'
	CH		B-9		
48.0		48.0 to 71.0' <u>Silt, (ML):</u> About 60% nonplastic fines, soft; about 40% medium plasticity clay; wet; olive green.		RD	Rotary Drilling with 4 1/2" bit. Hole sanding in. Added 5' of 6" casing, 35' total.
50.0	ML				
			S-9	P	50-52' Shelby Tube Push 200 psi push Recovery: 2.0'
52.0		52.0 to 53.0' Silty sand layer, fine to coarse sand, very loose; wet; olive gray, a few concretions.			
(-60.0')			B-10	DR	52-54' SPT Drive Blows: 2/2/4 N= 6 Recovery: 1.5', 1.0' slough End of shift 9/19/02
54.0					
56.0	ML			RD	Begin shift 9/20/02 Rotary Drilling with 4" bit.

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 4 OF 6
HOLE NO. BIS-1

PROJECT & FEATURE In-Delta Storage; Bacon Island, Pump Station 1

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
56.0		<u>INORGANIC SOILS</u> 16.0 to 100.0'			
58.0	ML	48.0 to 71.0' <u>Silt. (ML):</u> (cont.)		RD	Rotary drilling with 4 1/2" bit.
60.0		About 70% nonplastic fines; about 30% medium to high plasticity clay, stiff to very stiff; wet; olive green.	S-10	P	60-62' Shelby Tube Push 0 psi push Recovery: 2.0'
62.0 (-70.0')	ML		B-11	DR	62-63.5' SPT Drive Blows: 3/6/7 N= 13 Recovery: 1.5'
64.0					
66.0				RD	Rotary drilling with 4 1/2" bit.
68.0					
70.0	ML				End of shift 9/20/02
72.0 (-80.0')	SM	71.0 to 75.0' <u>Silty Sand. (SM):</u> About 80% fine to medium, subrounded to subangular sand, mostly quartz, compact to dense; about 20% nonplastic fines; wet; olive gray.	S-11	P	Begin shift 9/23/02 71-73' Shelby Tube Push 500 psi push Recovery: 1.5'
74.0			B-12	DR	73-74.5' SPT Drive Blows: 3/11/20 N= 31 Recovery: 1.5'
76.0	CL	75.0 to 82.0' <u>Lean Clay. (CL):</u>		RD	Rotary drilling 75' Lost circulation.

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 5 OF 6
HOLE NO. BIS-1

PROJECT & FEATURE In-Delta Storage; Bacon Island, Pump Station 1

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
76.0		<u>INORGANIC SOILS</u> 16.0 to 100.0'			
78.0	CL	75.0 to 82.0' <u>Lean Clay, (CL)</u> : About 70% low to medium plasticity clay, low dry strength, stiff; about 30% nonplastic fines; wet; olive green.		RD	Rotary drilling with 4 1/2" bit. Casing from 0 to 35'. Lost circulation, built up mud.
80.0	CL		S-12	P	80-82' Shelby Tube Push 0 psi push Recovery: 2.0' Sampler advanced under weight of rods.
82.0 (-90.0')	CH	82.0 to 91.0' <u>Fat Clay, (CH)</u> : About 60% medium to high plasticity clay, stiff; about 40% nonplastic fines; wet; olive green; some thin layers (1/2") of clayey silt.	B-13	DR	82-83.5' SPT Drive Blows: 2/3/4 N= 7 Recovery: 1.5'
84.0					
86.0	CH			RD	Rotary drilling with 4 1/2" bit. Lost circulation; built mud.
88.0					
90.0					
92.0 (-100.0')	CL	91.0 to 100.0' <u>Lean Clay, (CL)</u> : About 80% low to medium plasticity clay, medium dry strength, stiff; about 20% nonplastic fines; wet; olive green.	S-13	P	90-92' Shelby Tube Push 0 psi push Recovery: 2.0' Sampler advanced under weight of rods.
94.0			B-14	DR	92-93.5' SPT Drive Blows: 1/2/3 N= 5 Recovery: 1.5'
96.0	CL			RD	Rotary Drilling with 4 1/2" bit.

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 6 OF 6
HOLE NO. BIS-1

PROJECT & FEATURE In-Delta Storage; Bacon Island, Pump Station 1

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
96.0	CL	<u>INORGANIC SOILS</u> 16.0 to 100.0' 91.0 to 100.0' <u>Lean Clay, (CL): (cont.)</u> About 80% low to medium plasticity clay; about 20% nonplastic fines, stiff; wet; olive green.		RD	Rotary drilling 96.5-98.5' Shelby Tube Push 0 psi push Recovery: 0.8'
98.0			S-14	P	
100.0			B-15	DR	98.5-100.0' SPT Drive Blows: 3/4/5 N= 9 Recovery: 1.5'
(-108.0)		Total Depth - 100.0'			Backfilled hole with bentonite-cement grout using a tremie pipe.

State of California
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DRILL HOLE LOG

SHEET 1 of 6
HOLE NO. BIS-2
ELEV. -8.0 (Survey) FEET
DEPTH 100.0 FEET
DATE DRILLED 9/24/02 to 9/25/02
ATTITUDE Vertical
LOGGED BY T. Todd
DEPTH TO WATER 0.10'

PROJECT In-Delta Storage
FEATURE Bacon Island, Pump Station 2
LOCATION N. 57° 56.551' ; W. 121° 32.405' (GPS)
CONTR. Layne Christensen DRILL RIG CME 750

DR - 18" Standard Penetration Test S - Shelby Tube Sample
P - Push RD - Rotary Wash Drilling
B - Bag Sample

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
0.0	CL	<u>INORGANIC SOILS</u> 0.0 to 100.0'	S-1	P	0-20' Shelby Tube Push Recovery: 0'
2.0 (-10.0')		0.0 to 4.0' <u>Lean Clay, (CL)</u> : About 60% low to medium plasticity clay; about 40% nonplastic fines; very soft; olive brown, some reddish brown staining.	B-1	DR	2-3.5' SPT Drive Blows: 1/1/1 N= 2 Recovery: 1.0'
4.0	CL			RD	Began drilling with rotary wash method using a 4 1/2" tri-blade bit and "N-rod".
	SM	4.0 to 19.0' <u>Silty Sand, (SM)</u> : About 70% mostly fine, subrounded to subangular, loose to slightly compact, quartz sand; about 30% nonplastic fines; wet; olive gray.		P	5-7.0' Shelby Tube Push 0 psi push Recovery: 0
6.0			B-2	DR	7-8.5' SPT Drive Blows: 5/6/6 N= 12 Recovery: 1.5'
8.0	SM			RD	Rotary Drilling with 4 1/2" bit.
10.0		About 80% fine to medium, subangular to subrounded sand, abundant mica; about 20% nonplastic fines; loose to slightly compact; trace organics; wet; olive gray.		P	10-12.0' Shelby Tube Push 0 psi push Recovery: 0 Sampler advanced under weight of rod.
12.0 (-20.0')			B-3	DR	12.0-13.5' SPT Drive Blows: 2/4/6 N= 10 Recovery: 1.5'
14.0				RD	
16.0	SM		S-2	P	15-17.0' Shelby Tube Push 0 psi push Recovery: 2.0'

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 2 OF 6

HOLE NO. BIS-2

PROJECT & FEATURE In-Delta Storage; Bacon Island, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
16.0	SM	<u>INORGANIC SOILS</u> 0.0 to 100.0 '	S-2	P	Sampler advanced under weight of rods.
18.0		4.0 to 19.0' <u>Silty Sand, (SM)</u> (cont.)	B-4	DR	17-18.5' SPT Drive Blows: 1/2/1 N= 3 Recovery: 1.5'
20.0	CH	19.0 to 26.0' <u>Fat Clay, (CH)</u> : About 100% medium to high plasticity clay, stiff, high dry strength; moist; olive gray.		RD	Rotary Drilling with 4 1/2" bit.
22.0	CH		S-3	P	20-22.5' Shelby Tube Push 0 psi push Recovery: 2.0' Sampler advanced under weight of rods.
24.0			B-5	DR	22-23.5' SPT Drive Blows: 3/3/3 N= 6 Recovery: 1.5'
26.0				RD	
28.0	CL	26.0 to 31.0' <u>Lean Clay, (CL)</u> : About 100% low to medium plasticity clay; stiff to very stiff; low dry strength; moist; olive brown.	S-4	P	25-27.0' Shelby Tube Push 0 psi push Recovery: 2.0' Sampler advanced under weight of rods.
30.0	CL		B-6	DR	27-28.5' SPT Drive Blows: 4/4/5 N= 9 Recovery: 1.5'
32.0				RD	
34.0	SM		31.0 to 33.0' <u>Silty Sand, (SM)</u> : About 80% fine to coarse sand, slightly compact; about 20% nonplastic fines; wet; olive gray.	S-5	P
36.0	CH	33.0 to 48.0' <u>Fat Clay, (CH)</u> : About 100% medium to high plasticity clay, stiff to very stiff; moist; olive green, some reddish brown spots.	B-7	DR	32-33.5' SPT Drive Blows: 5/7/7 N= 14 Recovery: 1.5'
				RD	

State of California
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DRILL HOLE LOG

SHEET 3 OF 6
HOLE NO. BIS-2

PROJECT & FEATURE In-Delta Storage; Bacon Island, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
36.0		<u>INORGANIC SOILS</u> 0.0 to 100.0'			
	CH	33.0 to 48.0' <u>Fat Clay, (CH):</u> (cont.)		RD	Rotary Drilling with 4 1/2" bit.
38.0					
		39.0 to 40.5' Silty Sand layer: About 80% fine to coarse sand, loose; wet; olive gray.			
40.0		Medium to high plasticity clay, very stiff, high dry strength; moist; yellow brown with olive spots.			
	CH		S-6	P	40-42.0' Shelby Tube Push 100 psi push Recovery: 2.0'
42.0					
(-50.0')			B-8	DR	42-43.5' SPT Drive Blows: 4/6/8 N= 14 Recovery: 1.5'
44.0					
46.0				RD	Rotary Drilling with 4 1/2" bit. Steady Drilling Clay cuttings
	CH				
48.0					
	SM	48.0 to 75.0' <u>Silty Sand, (SM):</u> About 70% mostly fine to medium, subangular to subrounded, quartz sand, dense; about 30% nonplastic fines; wet; olive gray.			
50.0					
		About 85% fine to medium sand, dense; about 15% nonplastic fines; wet; light olive gray.	S-7	P	50-52.0' Shelby Tube Push 1000 psi push Recovery: 2.0'
52.0					
(-60.0')			B-9	DR	52-53.5' SPT Drive Blows: 7/18/21 N= 39 Recovery: 1.5'
54.0					
				RD	Rotary Drilling with 4 1/2" bit.
56.0	SM				

State of California
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DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 4 OF 6
HOLE NO. BIS-2

PROJECT & FEATURE In-Delta Storage; Bacon Island, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
56.0		<u>RECENT ALLUVIUM</u> 0.0 To 100.0'			
	SM	48.0 to 75.0' <u>Silty Sand, (SM):</u> (cont.)		RD	Rotary drilling with 4 1/2" bit.
58.0					
60.0		About 80% mostly fine to medium sand, dense to very dense; about 20% nonplastic fines; wet; olive gray.	S-8	P	60-62.0' Shelby Tube Push; 700 psi push Recovery: 2.0'
62.0 (-70.0')	SM		B-10	DR	62-63.5' SPT Drive Blows: 11/21/28 N= 49 Recovery: 1.5'
64.0					
66.0				RD	Rotary drilling with 4 1/2" bit. Steady drilling Sand cuttings End of shift 9/24/02
68.0					
70.0	SM		S-9	P	Begin shift 9/25/02 70-72.0' Shelby Tube Push 700 psi push Recovery: 2.0'
72.0 (-80.0')			B-11	DR	72-73.5' SPT Drive Blows: 13/17/10 N= 27 Recovery: 1.5'
74.0	SM	72.5 to 73.0' Lean Clay layer: stiff to very stiff; olive green.			
		Silty Sand – about 70% fine to medium sand, compact; about 30% nonplastic fines; olive gray.			
76.0	CH	75.0 to 79.0' <u>Fat Clay, (CH):</u>		RD	Rotary drilling

State of California
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DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 5 OF 6
HOLE NO. BIS-2

PROJECT & FEATURE In-Delta Storage; Bacon Island, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
76.0	CH	<u>INORGANIC SOILS</u> 0.0 to 100.0'		RD	Rotary drilling with 4 1/2" bit. Clay cuttings
78.0		75.0 to 79.0' <u>Fat Clay, (CH)</u> : Medium to high plasticity clay, stiff to very stiff; moist; olive brown.			
80.0	SM	79.0 to 88.0' <u>Silty Sand, (SM)</u> : About 70% mostly fine to medium, subangular to surrounded, quartz sand, some mica, dense; about 30% nonplastic fines; wet; olive gray.	S-10	P	80-82.0' Shelby Tube Push 800 psi push Recovery: 2.0'
82.0 (-90.0')			B-12	DR	82-83.5' SPT Drive Blows: 12/14/21 N= 35 Recovery: 1.5'
84.0					
86.0	SM			RD	Rotary drilling with 4 1/2" bit. Steady drilling
88.0		88.0 to 92.0' <u>Fat Clay, (CH)</u> : About 100% medium to high plasticity clay, stiff to very stiff; moist; olive.			
90.0	CH		S-11	P	90-92.0' Shelby Tube Push 100 psi push Recovery: 2.0'
92.0 (-100.0')		92.0 to 97.0' <u>Lean to Fat Clay, (CL/CH)</u> : About 60% medium plasticity clay, very hard; about 40% nonplastic fines; moist; olive gray.	B-13	DR	92-93.5' SPT Drive Blows: 7/20/27 N= 47 Recovery: 1.5'
94.0	CL/CH			RD	Rotary drilling with 4 1/2" bit.
96.0					

State of California
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DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 6 OF 6
HOLE NO. BIS-2

PROJECT & FEATURE In-Delta Storage; Bacon Island, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
96.0	CL/CH	<u>INORGANIC SOILS</u> 16.0 to 100.0'		RD	95.5-98.5' Shelby Tube Push: 800 psi push Recovery: 2.0'
	SM	92.0 to 97.0' <u>Lean to Fat Clay, (CL/CH):</u> (cont.)	S-12	P	98.5-100.0' SPT Drive Blows: 20/28/25 N= 53 Recovery 1.5'
98.0		97.0 to 100.0' <u>Silty Sand, (SM):</u> About 80% fine to medium, subangular to subrounded sand, very dense; about 20% nonplastic fines; wet; olive gray.	B-14	DR	
100.0 (-108.0')		Total Depth - 100.0'			Backfilled hole with bentonite-cement grout using a tremie pipe.

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SHEET 1 of 6
HOLE NO. WTS-1
ELEV. -6.0 (Survey) FEET
DEPTH 100.0 FEET
DATE DRILLED 10/01/02 to 10/03/02
ATTITUDE Vertical
LOGGED BY T. Todd
DEPTH TO WATER 5.0

DRILL HOLE LOG

PROJECT In-Delta Storage
FEATURE Webb Tract, Pump Station 1
LOCATION N. 38° 05.411' ; E. 121° 34.775' (GPS)
CONTR. Layne Christensen DRILL RIG CME 750

DR - 18" Standard Penetration Test S - Shelby Tube Sample
P - Shelby Tube Push RD - Wash Rotary Drilling
B - Bag Sample

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
0.0		<u>INORGANIC SOILS</u> 0.0 to 16.0'			
2.0	SM	0.0 to 11.0' <u>Silty Sand, (SM)</u> : About 60% mostly fine to medium, subrounded to subangular, quartz sand, very loose to slightly compact; about 40% nonplastic fines; dry to wet; yellow brown.	S-1	P	0-2.0' Shelby Tube Push 0 psi push Recovery: 2.0' Sampler advanced under weight of rods.
4.0			B-1	DR	2-3.5' SPT Drive Blows: 2/5/10 N= 15 Recovery: 1.5'
6.0				RD	Began rotary wash drilling using a 4 1/2" tri-blade bit and "N-rod". End of shift 10/01/02
8.0	SM	7.5' Color change. About 80% fine to medium subrounded to subangular mostly quartz sand, some mica, slightly compact; about 20% nonplastic fines; wet; olive gray.	B-2	DR	Begin shift 10/02/02 5-7.0' Shelby Tube Push 0 psi push Recovery: 0 Sampler advanced under weight of rods. 7-8.5' SPT Drive Blows: 3/6/8 N= 14 Recovery: 1.5'
10.0				RD	Steady drilling
12.0	CH	11.0 to 31.0' <u>Fat Clay, (CH)</u> : About 80% medium to high plasticity clay, very soft to soft, high dry strength; about 20% nonplastic fines; wet; dark olive.		P	10-12.0' Shelby Tube Push 0 psi push Recovery: 0
14.0			B-3	DR	12-13.5' SPT Drive Blows: 0/0/0 N= 0 Recovery: 1.5' Sampler advanced under weight of rods.
16.0	CH			RD	Easy drilling
				P	15-17.0' Shelby Tube Push 0 psi push Recovery: 1.0'

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 2 OF 6
HOLE NO. WTS-1

PROJECT & FEATURE In-Delta Storage; Webb Tract, Pump Station 1

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
16.0	CH	<u>INORGANIC SOILS</u> 0.0 to 100.0' 11.0 to 31.0' <u>Fat Clay, (CH):</u> (cont.)	S-2	P	17-18.5' SPT Drive Blows: 0/0/0 N= 0 Recovery: 1.5' Sampler advanced under weight of rods.
18.0			B-4	DR	
20.0				RD	
22.0	CH	About 60% medium to high plasticity clay; about 40% nonplastic fines; very soft to soft; wet; dark olive.		P	20-22.0' Shelby Tube Push 0 psi push Recovery: 0
24.0			B-5	DR	22-23.5' SPT Drive: 0/0/0 N= 0 Recovery: 1.5' Sampler advanced under weight of rods.
26.0				RD	Rotary wash drilling with 4 1/2" bit.
28.0	CH	About 70% medium to high plasticity clay; about 30% nonplastic fines; very soft to soft; wet; dark olive.	S-3	P	25-27.0' Shelby Tube Push 0 psi push Recovery: 2.0' Sampler advanced under weight of rods.
30.0			B-6	DR	27-28.5' SPT Drive Blows: 0/0/0 N= 0 Recovery: 1.5' Sampler advanced under weight of rods.
32.0				RD	Easy drilling
34.0	ML	31.0 to 37.0' <u>Silt, (ML):</u> About 80% nonplastic fines, soft; about 20% medium to high plasticity clay; wet; dark olive.	S-4	P	30-32.0' Shelby Tube Push 0 psi push Recovery: 2.0' Sampler advanced under weight of rods.
36.0			B-7	DR	32-33.5' SPT Drive Blows: 1/1/1 N= 2 Recovery: 1.5'
				RD	Easy drilling

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 3 OF 6
HOLE NO. WTS-1

PROJECT & FEATURE In-Delta Storage; Webb Tract, Pump

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
36.0	ML	<u>INORGANIC SOILS</u> 0.0 to 100.0'		RD	Rotary Drilling with 4 1/2" bit.
		31.0 to 37.0' <u>Silt (ML)</u> : (cont.)			
38.0	SM	37.0 to 58.0' <u>Silty Sand (SM)</u> : About 80% fine to medium, subrounded to subangular, mostly quartz sand, loose to slightly compact; about 20% nonplastic fines; wet; olive gray.			
40.0			S-5	P	40-42.0' Shelby Tube Push 0 psi push Recovery: 2.0' Sampler advanced under weight of rods.
42.0	SM		B-8	DR	42-43.5' SPT Drive Blows: 3/5/5 N= 10 Recovery: 1.5'
44.0 (-50.0')					
46.0	SM			RD	Rotary Drilling with 4 1/2" bit. Easy Drilling Sandy cuttings
48.0					
50.0		About 80% mostly fine to medium, subrounded to subangular, quartz sand, slightly compact to compact; about 20% nonplastic fines; wet; olive gray.	S-6	P	50-52.0' Shelby Tube Push 500 psi push Recovery: 2.0'
52.0	SM		B-9	DR	52-53.5' SPT Drive Blows: 3/8/13 N= 21 Recovery: 1.5'
54.0 (-60.0')				RD	Rotary Drilling with 4 1/2" bit.
56.0					

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 4 OF 6
HOLE NO. WTS-1

PROJECT & FEATURE In-Delta Storage; Webb Tract, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
56.0		<u>INORGANIC SOILS</u> 0.0 to 100.0'			
	SM	37.0 to 58.0' <u>Silty Sand, (SM):</u> (cont.)		RD	Rotary drilling with 4 1/2" bit. Sandy cuttings
58.0	ML	58.0 to 72.0' <u>Silt, (ML):</u> About 80% nonplastic fines, stiff to very stiff; about 20% medium to high plasticity clay; wet; dark olive.			
60.0			S-7	P	60-62.0' Shelby Tube Push 500 psi push Recovery: 2.0'
62.0		62.0 to 63.0' About 85% fine to coarse, subrounded to subangular, quartz sand; about 15% nonplastic fines; slightly compact; wet; olive gray.	B-10	DR	62-63.5' SPT Drive Blows: 3/5/10 N= 15 Recovery: 1.5'
64.0 (-70.0')	ML	63.0 to 72.0 About 60% nonplastic fines; about 40% medium to high plasticity clay, stiff to very stiff; wet; dark olive.			
66.0				RD	Rotary drilling with 4 1/2" bit. Steady drilling
68.0					
70.0	ML	About 60% nonplastic fines; about 40% medium plasticity clay, hard to very hard; wet; dark olive.	S-8	P	70-72.0' Shelby Tube Push 500 psi push Recovery: 1.5'
72.0		72.0 to 77.0' <u>Silty Sand, (SM):</u> About 60% mostly fine subrounded to subangular sand, dense; about 40% nonplastic fines; wet; dark olive.	B-11	DR	72-73.5' SPT Drive Blows: 5/14/21 N= 35 Recovery: 1.5'
74.0 (-80.0')	SM			RD	Rotary drilling
76.0					

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 5 OF 6
HOLE NO. WTS-1

PROJECT & FEATURE In-Delta Storage; Webb Tract, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
76.0	SM	<u>INORGANIC SOILS</u> 0.0 to 100.0'			
		72.0 to 77.0' <u>Silty Sand, (SM)</u> : (cont.)		RD	Rotary drilling with 4 1/2" bit.
78.0	s(ML)	77.0 to 88.0' <u>Sandy Silt, s(ML)</u> : About 70% nonplastic fines, hard; about 30% fine sand; wet; dark olive.			
80.0			S-9	P	80-82.0' Shelby Tube Push 500 psi push Recovery: 2.0'
82.0			B-12	DR	82-83.5' SPT Drive Blows: 15/13/19 N= 32 Recovery: 1.5'
84.0 (-90.0')	s(ML)				Sandy cuttings
86.0				RD	Rotary drilling with 4 1/2" bit. Steady drilling
88.0	CL	88.0 to 93.0' <u>Lean Clay, (CL)</u> : About 80% low to medium plasticity clay, hard to very hard; about 20% nonplastic fines; moist; dark olive.			End of shift 10/2/02
90.0	CL		S-10	P	Begin shift 10/3/02 90-92.0' Shelby Tube Push 500 psi push Recovery: 2.0'
92.0			B-13	DR	92-93.5' SPT Drive Blows: 9/15/18 N= 33 Recovery: 1.5'
94.0 (-100.0')	SM	93.0 to 100.0' <u>Silty Sand, (SM)</u> : About 70% fine to medium sand, dense; about 30% nonplastic fines; wet; olive gray.		RD	Rotary drilling with 4 1/2" bit.
96.0					

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 6 OF 6
HOLE NO. WTS-1

PROJECT & FEATURE In-Delta Storage; Webb Tract, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
96.0	SM	<u>INORGANIC SOILS</u> 0.0 to 100.0' 93.0 to 100.0' <u>Silty Sand, (SM)</u> (cont.) About 60% fine sand; about 40% nonplastic fines; dense to very dense; wet; dark olive.		RD	95.5-98.5' Shelby Tube Push 1000 psi push Recovery: 2.0'
98.0			S-11	P	
100.0	SM		B-14	DR	98.5-100.0' SPT Drive Blows: 17/29/30 N= 59 Recovery 1.5'
(-106.0')		Total Depth - 100.0'			Backfilled hole with bentonite-cement grout using a tremie pipe.

State of California
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DEPARTMENT OF WATER RESOURCES

DRILL HOLE LOG

SHEET 1 of 6
HOLE NO. WTS-2
ELEV. -13.0 (Survey) FEET
DEPTH 100.0 FEET

PROJECT In-Delta Storage DATE DRILLED 9/26/02 to 10/01/02
FEATURE Webb Tract, Pump Station 1 ATTITUDE Vertical
LOCATION N. 38° 03.880' ; W. 121° 35.291' (GPS) LOGGED BY T. Todd
CONTR. Layne Christensen DRILL RIG CME 750 DEPTH TO WATER 3.5'

DR - 18" Standard Penetration Test S - Shelby Tube Sample
P - Shelby Tube Push RD - Rotary Wash Drilling
B - Bag Sample

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
0.0		<u>RECENT ALLUVIUM</u> 0.0 to 3.0'			
2.0	CH	0.0 to 3.0' <u>Fat Clay, (CH)</u> : About 70% medium plasticity clay, very soft to soft; about 30% nonplastic fines; trace fine sand; damp to moist; dark brown.	S-1	P	0-2.0' Shelby Tube Push 0 psi push Recovery: 0.5' Sampler advanced under weight of rods.
			B-1	DR	2-3.5 SPT Drive Blows: 2/5/10 N= 15 Recovery: 0.5'
4.0	OH	<u>ORGANIC SOILS</u> 3.0 to 23.0'			
		3.0 to 23.0' <u>Organic Fat Clay, (CH)</u> : About 80% medium to high plasticity clay, very soft, high dry strength; about 20% nonplastic fines; trace of organic fibers; moist; dark gray to black.		RD	3.5' Began rotary wash drilling using a 4 1/2" tri-blade bit and "N-rod".
6.0				P	5-7.0' Shelby Tube Push 0 psi push. Recovery: 0 Sampler advanced under weight of rods.
8.0				DR	7-8.5' SPT Drive Blows: 3/6/8 N= 14 Recovery: 0.5'
			B-2		
10.0				RD	Steady drilling
12.0	OH			P	10-12.0' Shelby Tube Push 0 psi push Recovery: 0 Sampler advanced under weight of rods.
14.0			B-3	DR	12-13.5' SPT Drive Blows: 0/0/0 N= 0 Recovery: 1.0' Sampler advanced under weight of rods.
		Very soft, high dry strength; moist to wet; some organic fibers; dark gray to black.		RD	Easy drilling
16.0				P	15-17.0' Shelby Tube Push 0 psi push Recovery: 0

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 2 OF 6
HOLE NO. WTS-2

PROJECT & FEATURE In-Delta Storage; Webb Tract, Pump Station 1

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
16.0					
(-30.0')	OH	<u>ORGANIC SOILS</u> 3.0 to 23.0'		P	Sampler advanced under weight of rods.
18.0		3.0 to 23.0' <u>Organic Fat Clay, (OH):</u> (cont.)	B-4	DR	17-18.5' SPT Drive Blows: 0/0/0 N= 0 Recovery: 1.5' Sampler advanced under weight of rods.
		Very soft; abundant organic fibers; dark gray to black.		RD	Rotary drilling with 4 1/2" bit.
20.0					
	OH	Some sandy clay, irregular contact.	S-2	P	20-22.0' Shelby Tube Push 0 psi push Recovery: 2.0' Sampler advanced under weight of rods.
22.0		<u>INORGANIC SOILS</u> 23.0 to 100.0'			
			B-5	DR	22-23.5' SPT Drive Blows: 2/3/5 N= 8 Recovery: 1.5'
24.0	SM	23.0 to 53.0' <u>Silty Sand, (SM):</u> About 70% fine to medium, subrounded to subangular, mostly quartz sand, loose to slightly compact, about 30% nonplastic fines; wet; olive gray.		RD	Rotary wash drilling with 4 1/2" bit.
26.0				P	25-27.0' Shelby Tube Push 0 psi push Recovery: 0' Sampler advanced under weight of rods.
28.0	SM	About 60% fine to medium sand, slightly compact; about 40% nonplastic fines; wet; olive gray.	B-6	DR	27-28.5' SPT Drive Blows: 2/5/6 N= 11 Recovery: 1.5'
(-40.0')				RD	
30.0					
			S-3	P	30-32.0' Shelby Tube Push 500 psi push Recovery: 2.0'
32.0	SM	About 75% mostly fine sand, slightly compact to compact; about 25% nonplastic fines; wet; olive gray.		DR	32-33.5' SPT Drive Blows: 5/9/12 N= 21 Recovery: 1.5'
34.0				RD	Rotary drilling with 4 1/2" bit.
36.0					

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 3 OF 6
HOLE NO. WTS-2

PROJECT & FEATURE In-Delta Storage; Webb Tract, Pump

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
36.0	SM	<u>INORGANIC SOILS</u> 23.0 to 100.0'		RD	Rotary Drilling with 4 1/2" bit.
(-50.0')					
38.0	SM	23.0 to 53.0' <u>Silty Sand, (SM):</u> (cont.) About 80% fine to medium subrounded to subangular, mostly quartz sand, compact to compact; about 20% nonplastic fines; slightly wet; olive gray, some sandy clay layers.		P	40-42.0' Shelby Tube Push 100 psi push Recovery: 0'
40.0					
42.0			B-8	DR	42-43.5' SPT Drive Blows: 3/9/7 N= 16 Recovery: 1.5'
44.0					
46.0	SM			RD	Rotary Drilling with 4 1/2" bit. Easy Drilling Sandy cuttings
(-60.0')					
48.0					
50.0					
52.0	CL	53.0 to 55.0' <u>Lean Clay, (CL):</u> About 80% low plasticity clay, very stiff to hard; about 20% nonplastic fines; moist; olive.	S-4	P	50-52.0' Shelby Tube Push 700 psi push Recovery: 2.0'
54.0					
56.0					
	SM	55.0 to 71.0' <u>Silty Sand, (SM):</u>	B-9	DR	52-53.5' SPT Drive Blows: 5/9/9 N= 18 Recovery: 1.5'
				RD	Rotary Drilling with 4 1/2" bit.

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 4 OF 6
HOLE NO. WTS-2

PROJECT & FEATURE In-Delta Storage; Webb Tract, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
56.0	SM	<u>INORGANIC SOILS</u> 23.0 to 100.0' 55.0 to 71.0' <u>Silty Sand, (SM)</u> : About 70% fine to medium, subrounded to subangular, mostly quartz sand, compact; about 30% nonplastic fines; wet; olive gray; 1" to 6" clay bands. About 85% mostly fine to medium, subrounded to subangular sand, compact to dense; about 15% nonplastic fines; wet; olive gray.		RD	Rotary drilling with 4 1/2" bit.
(-70.0')					
58.0					
60.0	SM		S-5	P	60-62.0' Shelby Tube Push 700 psi push Recovery: 2.0'
62.0			B-10	DR	62-63.5' SPT Drive Blows: 7/12/19 N= 31 Recovery: 1.5'
64.0	SM			RD	Rotary drilling with 4 1/2" bit. Steady drilling Sandy cuttings.
66.0					
(-80.0')					
68.0	SM	68.5 to 69.0' Sandy with some clay in cuttings.			
70.0			S-6	P	70-72.0' Shelby Tube Push 500 psi push Recovery: 2.0'
72.0	CH	71.0 to 79.0' <u>Fat Clay, (CH)</u> : About 100% medium to high plasticity clay, hard, high dry strength; trace nonplastic fines; moist; dark olive.	B-11	DR	72-73.5' SPT Drive Blows: 4/7/12 N= 19 Recovery: 1.5'
74.0	CH	Some sandy layers.		RD	Rotary drilling
76.0					

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 5 OF 6
HOLE NO. WTS-2

PROJECT & FEATURE In-Delta Storage; Webb Tract, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
76.0	CH	<u>INORGANIC SOILS</u> 23.0 to 100.0'			
(-90.0')		71.0 to 79.0' <u>Fat Clay, (CH)</u> : (cont.)		RD	Rotary drilling with 4 1/2" bit.
78.0					
	SM	79.0 to 94.0' <u>Silty Sand, (SM)</u> : About 60% mostly fine to medium, subrounded to subangular, quartz sand, compact to dense; about 30% nonplastic fines; about 10% clay; wet; dark olive.	S-7	P	80-82.0' Shelby Tube Push 800 psi push Recovery: 2.0'
80.0					
			B-12	DR	82-83.5' SPT Drive Blows: 3/7/19 N= 26 Recovery: 1.5'
82.0					
	SM				
84.0					
				RD	Rotary drilling with 4 1/2" bit. Steady drilling
86.0					
(-100.0')					
88.0					
	SM	About 60% fine sand, dense to very dense; about 30% nonplastic fines; about 10% clay; wet; dark olive.	S-8	P	90-92.0' Shelby Tube Push 0 psi push Recovery: 2.0' Sampler advanced under weight of rods. (Slough?)
90.0					
			B-13	DR	92-93.5' SPT Drive Blows: 13/30/32 N= 62 Recovery: 1.5'
92.0					
	ML	94.0 to 98.5' <u>Silt, (ML)</u> : About 80% nonplastic fines, hard; about 20% fine sand; wet; dark olive.			
94.0				RD	Steady drilling.
96.0					

State of California
The Resources Agency
DEPARTMENT OF WATER RESOURCES
DRILL HOLE LOG

SHEET 6 OF 6
HOLE NO. WTS-2

PROJECT & FEATURE In-Delta Storage, Webb Tract, Pump Station 2

DEPTH (ELEV.)	LOG	FIELD CLASSIFICATION AND DESCRIPTION	SAMPLE NO.	MODE	REMARKS
96.0	ML	<u>INORGANIC SOILS</u> 23.0 to 100.0'		RD	96.5-98.5' Shelby Tube Push; 1000 psi push Recovery: 1.8'
(-110.0')			S-9	P	
98.0	CH	94.0 to 98.5' <u>Silt, (ML)</u> (cont.)			98.5-100.0' SPT Drive 16/20/28 N= 48 Recovery 1.5'
			B-14	DR	
100.0		98.5 to 100.0' <u>Fat Clay, (CH)</u> : About 100% medium to high plasticity clay, very hard; moist; dark olive.			
		Total Depth - 100.0'			Backfilled hole with bentonite-cement grout using a tremie pipe.